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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/553,644

10/14/2005

Shan Wan

128346.60801

1449

7590

09/19/2007

Pepper Hamilton  
500 Grant Street, 50th Floor  
Pittsburgh, PA 15219

EXAMINER

JOHNSON, KEVIN M

ART UNIT

PAPER NUMBER

1709

MAIL DATE

DELIVERY MODE

09/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/553,644

Applicant(s)

WAN, SHAN

Examiner

Kevin M. Johnson

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 4/17/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5/5/2006 and 10/14/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Status***

1. Claims 1-21 are pending and presented for examination.

### ***Information Disclosure Statement***

1. The information disclosure statements (IDS) submitted on 10/14/2005 and 5/5/2006 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 16 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. The term "substantially uniform size" in claims 4, 16 and 21 is a relative term that renders the claim indefinite. The term "substantially uniform" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is not clear what level of uniformity constitutes "substantially uniform," and therefor one would be unable to determine what the metes and bounds of the claims are.

***Claim Rejections - 35 USC § 102/103***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hyun et al. (EP 0352811A).

The claims are drawn to a tool insert comprising an abrasive layer on a substrate. Where the abrasive layer is formed through a high temperature high pressure process from bimodal powder mixture of fine and coarse particles having at least one of polycrystalline diamond or cubic boron nitride. The average size ratio of fine to coarse particles being between 0.1 and 0.5 and the standard deviation of particle size distribution being smaller than  $0.6d$ , where  $d$  is the average particle size. The abrasive layer is disclosed to have a sum value of an impact resistance number and an abrasion resistance number greater than 19,000.

Hyun teaches a backed superabrasive cutting element formed through a high temperature high pressure process. The superabrasive particles can be either diamond

or cubic boron nitride and the precursor powder may contain two sizes of particles. The particle sizes are uniform with a standard deviation of less than  $0.6d$  (p.6, line 26-28), and an average size ratio of 0.13 (example 8, and p.6 line 31).

The claims further require a sum value of an impact resistance number and an abrasion resistance number greater than 19,000. Although Hyun does not explicitly teach this characteristic, this property is considered to be inherent to the composition of the material. Products of identical composition may not have mutually exclusive properties *In re Spada* 15 USPQ2d 1655, 1658 (Fed. Circ. 1990).

It is well established that when a claimed composition appears to be substantially the same as a composition disclosed in the prior art, the burden is properly upon the applicant to prove by way of tangible evidence that the prior art composition does not necessarily possess characteristics attributed to the claimed composition. *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Circ. 1990); *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980); *In re Swinehart*, 439 F.2d 2109, 169 USPQ 226 (CCPA 1971).

Claims 9-15 and 21 are drawn to an abrasive tool insert formed from a bimodal powder where the aspect ratio of the particles is greater than 0.5 and the volume fraction of the fine particles is between 15% and 70%, and the volume fraction of the coarse particles is between 30% and 85%. The abrasive layer contains at least 93% diamond by volume.

Hyun teaches a bimodal precursor powder consisting of particles with nearly spherical diameters (p.6 line 24) where the fine particles account for up to 20% of the

volume of the powder (p.6 line 12). The abrasive layer contains between 10% and 96% by volume superabrasive particles, one of the choices for which is diamond (claim 25).

Hyun fails to explicitly disclose the aspect ratio of the particles.

Claims 9-15 and 21 are readily envisaged by the teachings of Hyun.

It would have been obvious to one skilled in the art at the time of the invention to make a proper selection that would satisfy the requirements of Hyun that would also fall within the ranges claimed, and that spherical particles have an aspect ratio in excess of 0.5.

Claims 16-20 are drawn to a method of manufacturing a tool insert through a high temperature high pressure process by forming an abrasive layer from a bimodal powder of at least one of polycrystalline diamond and cubic boron nitride, consisting of fine particles and coarse particles of uniform sizes. The aspect ratio of the particles being greater than 0.3 and the size ratio of fine to coarse particles is between 0.02 and 0.75. The fine particles have a volume fraction of between 5% and 90% and the coarse particles have a volume fraction of 10% to 90%. The resulting abrasive layer has a sum value of an impact resistance number greater than or equal to 19,000.

Hyun teaches a method of producing an abrasive consisting of a high temperature high pressure process using a bimodal precursor powder consisting of coarse spherical particles and fine spherical particles with a fine to coarse particle size ratio of 0.13 and a fine particle volume fraction of up to 20%. The abrasive layer may be bonded to a substrate.

The instant claims differ from Hyun in that the aspect ratio of the particles is not explicitly disclosed and that the sum value of the impact resistance and abrasion resistance of the material is not taught.

Hyun envisages the requirements of claims 16-20, and the properties that are not explicitly disclosed are considered to be inherent to the material.

It would have been obvious to one skilled in the art at the time of the invention that spherical particles would have an aspect ratio greater than 0.3 and that the process taught by Hyun would produce a product with a sum value of an impact resistance number and an abrasion resistance number greater or equal to 19,000 because the composition produced in by the instant claims is the same as the composition taught by Hyun and impact and abrasion resistance are inherent properties of the material.

One would be motivated to make these modifications in pursuit of a material with greater abrasion and impact resistance.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Raymond et al. (US 5855996A), Chen et al. (US 5096465A) and Hall (US 4604106A) teach abrasive diamond compositions.

9. All claims (1-21) are rejected. No claims are allowed.

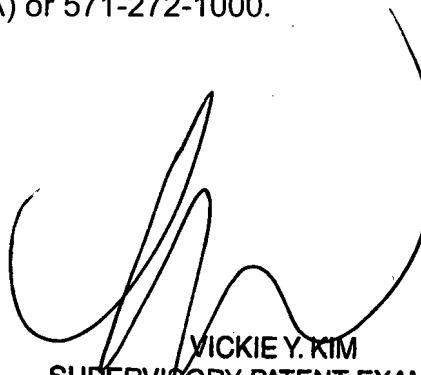
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Johnson whose telephone number is 571-270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMJ



VICKIE Y. KIM  
SUPERVISORY PATENT EXAMINER